[intro music]

Maggie Masetti: Welcome to Blueshift, the podcast from the Astrophysics Science Division at NASA's Goddard Space Flight Center. I'm Maggie Masetti. In this International Year of Astronomy, our astrophysics outreach team is making special efforts to elevate public awareness of all kinds of cosmic exploration. For example, on April 4th, visitors to a miles-long stretch of the Baltimore-Annapolis Trail in eastern Maryland could walk a scale model of the solar system and, at appropriate spots along the way, talk about the sun and planets with our experts. Here's our own Francis Reddy with more.

Francis Reddy: Think of the Planet Walk in Glen Burnie, Maryland, as a supersized version of the model solar systems we all made in grade school. It shrinks the distance between the sun and planets by about 800 million times. On April 4th, a clear and blustery Saturday, hundreds of people came out for a 4.6-mile stroll across the solar system. I decided to join them.

My first stop is the Sun, which is located on a strip of greenway behind the Harundale Plaza shopping center. A sculpture called Spectrum, which boasts 48 prisms, marks the spot. Artist Judy Sutton Moore created it, and she'll eventually install sculptures at
the locations of each planet, too.

On a model this big, you can appreciate how much space the solar system takes up -- and how little of that space includes planets.

Brit Griswald: Hi, this is Brit Griswald. I'm at Goddard Space Flight Center and I find the Sun incredibly large. On this planetwalk, it's 5 and a half feet across.

Francis Reddy: People are hovering around a solar telescope and taking a peek at the sun. I see a few prominences arching high above the edge of an otherwise featureless orange disk. After all, we're at sunspot minimum now.

Dean Pesnell: Hi, I'm Dean Pesnell, one of the project scientists with the Solar Dynamics Observatory and every time I look at the sun it's different. Every time I look at it it's different in some way. Right now there's no spots. Wait five years there'll be a lot of spots. But every time you look at it it's different.

Francis Reddy: Sunlight moves through space at more than 670 million miles per hour. It takes more than 3 minutes to reach Mercury at the planet's average distance.

I can do better on the model. I only have to walk 264 feet.

Larry Evans: My name is Larry Evans, I work at Goddard Space Flight Center. One of the missions I'm on is MESSENGER, which is going to Mercury. One fact about Mercury, its day is longer than its year. It takes 180 Earth Days for a day but only 90 Earth Days for a year.

Francis Reddy: After another 158 feet, I'm at Venus. A highly reflective global cloud cover makes Venus really bright, sometimes bright enough to see during the day. Over the centuries, this has led to various reports of Venus as a comet on a collision course with Earth, a balloon-borne lighting experiment of Thomas Edison, and as more than a few UFOs.

Herman Heyn: My name is Herman Heyn. I'm affiliated with Project Astro. What I find fascinating about Venus is the history of the discovery of the phases of Venus by Galileo and Copernicus.

Francis Reddy: Sunlight takes 6 minutes to reach Venus. On the model, I'm still superluminal. Cool.

Earth. Home sweet home. The nicest place in the solar system.

Maggie Masetti: Hi, I'm Maggie Masetti, I work at NASA's Goddard Space Flight Center and Earth is the only planet we know of with oceans of liquid water.

Francis Reddy: Sunlight reaches Earth in just over 8 minutes, and I'm 630 feet into the model. On this scale, our world is a bit over half an inch across, or about half the size of a meatball. The moon is smaller than a dried pea.

I must be getting hungry.

About 950 feet into the model, I reach Mars. Sunlight takes around 12 minutes to travel this distance, and at this scale the Red Planet is about the size of a blueberry.

Doug Schwer: Hi, my name is Doug Schwer and I work at the Naval Research Lab. One thing that I find most fascinating about Mars is probably the fact that at one point during its history it had all sorts of water and that water has since disappeared and so it has a very interesting geology about it.

Francis Reddy: Consider that on this day, Spirit, the NASA rover now past its fifth full year on Mars, has rolled only 4.8 miles, a bit more than the total length of this Planet Walk. The odometer on Opportunity, the more heavily driven rover, shows about twice Spirit's mileage.

Now the hard work begins. Jupiter is more than three times Mars' distance from the sun. The pathway continues over a wooden bridge that carries me across a leaf-covered dip in the terrain. I see at least four rusting, half-buried shopping carts below. Appropriate debris, I guess. I'm crossing the asteroid belt.

Thirty-two hundred feet down the Planet Walk I come to Jupiter. The solar system's largest planet. More than 11 times Earth's diameter. On this scale, it's a bit larger than a softball.

Matt Davis: This is Matt Davis. I work at the Goddard Space Flight Center. And one of the coolest things, I think, about Jupiter is that it's the most massive planet in the Solar System. More massive than everything else combined, except the Sun.

Francis Reddy: Jupiter is a planet's planet. One could make the case that our planetary system consists of Jupiter, plus debris. Many people think Jupiter is a failed star, but that's not quite right. Jupiter never had a shot at stardom. It would need about 80 times its current mass to qualify.

Saturn is the solar system's prettiest planet. It awaits just past the first mile, or about one quarter of the way through the walk. Sunlight takes about 80 minutes to reach this far. NASA's Cassini spacecraft has been orbiting Saturn since 2004 and is still going strong. While all of the giant planets possess rings, Cassini's images confirm that Saturn's are by far the most photogenic.

Tiffany Borders: My name is Tiffany Borders. I work at the Space Telescope Science Institute. I am a research and instrument analyst on the Wide Field Planetary Camera 3 team. One interesting fact about Saturn is we're still not entirely sure how it was able to develop its rings. We think that it could have been maybe the remains of the planet when it was formed. Or maybe another body, like another moon – maybe some of the material had fallen apart and was captured around the planet. So we're still trying to understand exactly where the material from rings came from.

Francis Reddy: Saturn is conveniently located opposite the J.C. Penny's at the Marley Station Mall. I pass up the shoppourtiny and press on.

Uranus -- and I'm using the least objectionable pronunciation here -- takes me to about the model's halfway mark. It's as far to Uranus from Saturn as Saturn is from the sun. So it's another mile and change to the next stop.

Why do you think they call it space?

Sunlight takes more than two and a half hours to reach Uranus. I'm now 19 times farther than Earth's distance from the sun. Out here, it's cold, it's dark, and the food court is a mile away in the wrong direction.

Jim Lochner: I'm Jim Lochner. I work in the Astrophysics Science Division at NASA Goddard Space Flight Center and my fact about Uranus is that it rotates on its side and currently its north pole points in the direction of its travel around the Sun.

Francis Reddy: Three and half miles from the model sun, I approach the farthest planet humanity's machines have directly explored. The Voyager 2 spacecraft cruised past Neptune in 1989. It took 12 years to get here.

Jeff Livas: Hi, I'm Jeff Livas and I work at NASA Goddard Space Flight Center in the Gravitational Astrophysics Lab. I work on the LISA project which is a gravity wave detector in space. People often wonder why Neptune is blue and the answer is that the outer atmosphere contains a trace amount of methane, about 2%, and methane absorbs red very well. So when sunlight bounces off Neptune, the red gets absorbed in the upper atmosphere and all you see is blue.

Francis Reddy: Technically, I've reached the solar system's last true planet . But I'll press on to Pluto. It's only another mile or so up the path. I've come this far, right?

Pluto's average distance places it 3.7 billion -- billion with a b -- miles from the sun. That's so far out even sunlight takes over 5 hours to make the trip. Pluto is one-fifth Earth's size. On this scale, it's only about as wide as the thickness of two dimes.

Back in 2005, astronomers found a Pluto-like body now named Eris. Because Pluto is slightly smaller than Eris, the discovery brought to a head a long-simmering issue of Pluto's own planethood.

Hannah Jang-Condell: Hi, I'm Hannah Jang-Condell. I'm a researcher at NASA's Goddard Space Flight Center and University of Maryland. What I like about Pluto is that even though it's small, it's capable of raising a great deal of fuss, especially among us Earthlings who are worrying about whether or not it's a planet. It is not a planet because it is part of what's called the Kuiper Belt, which is similar to the Asteroid Belt. It's one of the larger objects there, but not the largest.

Francis Reddy: NASA's New Horizons mission is now enroute to Pluto, but don't hold your breath. It won't get there until 2015.

Having reached the edge of this model solar system, I can't help but wonder how far it is to the nearest star, Proxima Centauri, at this same scale.

Sunlight takes 4.22 years to reach the star. At the Planet Walk scale, that equals a stroll some 31,000 miles long. It's equivalent to traveling one and a quarter times around the world -- or 13 percent of the distance to the moon.

I'm not up for that. I'm hittin' the mall.

Maggie Masetti: The Planet Walk is a part of the Baltimore and Annapolis Trail, a linear park whose name comes from the now-defunct railroad that once used the corridor. It was the second so-called "rail trail" to be created in Maryland. Support from NASA's Goddard Space Flight Center, the Maryland Department of Transportation, and other commercial and public entities made the Planet Walk possible.

We'll be back in a couple of weeks with a new episode. This is Maggie Masetti, bringing the universe closer to you with Blueshift.

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